EPA Region 7 TMDL Review

TMDL ID	355	*Water Body ID*	IA-04-LDM-00150-L
Water Body Name	Indian Lake		
Pollutant	Organic Enrichment and Noxious Aquatic Plants		
Tributary			
State	IA [illegible]		[illegible]
Basin	Des Moines River		
Submittal Date	2/2/2005		
Approved			

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/ water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

A letter dated February 1, 2005 and received by EPA February 2, 2005 formally submitted this TMDL document for approval.

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

Noxious aquatic plants are associated with excessive nutrient (phosphorus) loadings. Elevated phosphorus loading is the cause of the impairment of Primary Contact Recreation (Class A1) and Aquatic Life (Class B(LW)) uses. Phosphorus is related to chlorophyll and Secchi depth through the Trophic State Index and targeted to address the organic enrichment and noxious aquatic plant impairment. Load capacity for total phosphorus which varies with proportion internally versus externally loaded will result in the attainment of water quality standards. The specific loads are spelled out in tabular form and range from 150 to 80 pounds per year depending on the internal / external mix.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

Water quality standards and beneficial uses are described as well as applicable narrative criteria. Phase I targets for this phased TMDL are established based on improving the lake's trophic state to correspond to a Trophic State Index (TSI) value for total phosphorus of <70, and for both chlorophyll and Secchi depth of <65.

Link Between Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

Based on linkages between phosphorus, algae (chlorophyll) and turbidity (Secchi depth) expressed by trophic state indices, a decrease in total phosphorus will result in a decrease in organic enrichment and noxious aquatic plants. By reducing the TSI for total phosphorus to <70 the TSIs for chlorophyll and Secchi depth should be reduced to <65 based on the relationships seen in this lake. Allocations are based on a model which accounts for internal as well as external load. Methods are given to calculate the internal load given an external load and the reverse.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

Three sources were quantified for Indian Lake. These are 1). Direct watershed drainage 2). Internal loading from lake sediments, and 3). Atmospheric deposition. There are no point sources in the watershed. The model used indicates 33% of the load is internal, this phosphorus is more available for aquatic plant use and is estimated to have 4.5 times the impact on aquatic plant growth as externally loaded phosphorus. Other nonpoint sources within the watershed exist. This category includes septic systems, pit toilets, individual residences, businesses, manure and waste from wildlife and pets. These sources will be identified and quantified as required in phase II of this TMDL. All significant sources have been considered.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

Phase I of this TMDL is to reduce phosphorus loading to achieve an in-lake TSI(TP)<70 resulting in TSIs for Secchi depth and chlorophyll of <65. This will be accomplished with a total phosphorus loading capacity of from 80 to 150 pounds per year depeding on proportion of internal versus external load.

WLA Comment

There are no point source contributions to this lake, the WLA is set to zero.

LA Comment

Load allocation varies as the source (internal and external) proportion changes. An example given is; internal load 30 pounds and external load 90 poundes for a total load allocation in this example of 120 pounds per year. The TMDL provides graphical relationships to perform these calculations at all levels of both internal and external load.

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

The margin of safety is explicit as the target phosphorus loads were calculated based on an in-lake concentration 10% lower than the desired endpoint. Using the model from the TMDL this would amount to 25 pounds per year external load or 6 pounds per year internal load of phosphorus.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

The TMDL was based on annual loads which will result in attainment of the TSI targets during the growing season.

Public Participation

Submital describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

This TMDL was presented at a public meeting in Farmington, IA on December 13, 2004. It was also placed on public notice through the IDNR website. Comments were reviewed and where appropriate incorporated into the TMDL.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

Follow-up monitoring will continue to meet, at a minimum, the minimum data requirements established by Iowa's 305(b) guidelines. An assessment will be completed by 2010

containing 3 lake samples per year for three years or 10 lake samples over a two year period. The TMDL program expressed its commitment to follow-up monitoring. A protocol for determining sediment flux of phosphorus is being developed and when complete this lake will be evaluated with this protocol.

Reasonable assurance

Reasonable assurance only applies when reduction in nonpoint source loading is required to meet the prescribed waste load allocations.

Nonpoint source loading was not reduced to meet prescribed waste load allocations. No allowances for increased nonpoint source phosphorus loading were included in the TMDL. Significant changes in the watershed land use was deemed unlikely. No waste load allocation is included in this TMDL.
